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Polymer Containing Functional End Groups Is Base for New Polymers

Butadiene has been polymerized with lithium-p-lithiophenoxide (lithium salt of p-hydroxyphenyl lithium) to produce a linear polymer containing an oxy-lithium group at one end and an active carbon-lithium group at the other end. This polybutadiene-based polymer



is one of a class of macromolecules that have been designated "living polymers." Such polymers will remain stable even after long storage periods, and will still be capable of reacting with specific monomers to form more complex polymers.

These living polymers represent a new approach to the preparation of difunctional polymers in which structural features, molecular weight, type, and number of end groups can be controlled. For example, the polybutadiene-based living polymer has been reacted with silicon tetrachloride to form a four-armed star polymer centered on the silicon atom and terminated at each arm by a lithiophenoxide group. The living polymer has also been reacted with carbon dioxide to produce a polymer terminated at one end with a phenolic hydroxy group and at the other with a carboxyl group. The latter polymer molecule can be reacted at either end or at both ends to form star, block, and graft polymers. These new polymers have potential application in the development of

binders, adhesives, elastomers, protective coatings, and structural materials where specific chemical and physical requirements must be met.

Note:

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Polymers Containing Functional Groups

Polymers containing functional groups are of interest in many areas of science and technology. These polymers are used in a wide variety of applications, including adhesives, coatings, and composites. The functional groups in these polymers can be used to modify the properties of the polymers, such as their solubility, reactivity, and mechanical strength. This paper discusses the synthesis and properties of polymers containing functional groups, with a particular emphasis on the use of these polymers in the field of composites.

The functional groups in polymers can be classified into two main categories: reactive groups and non-reactive groups. Reactive groups are those that can participate in chemical reactions, while non-reactive groups are those that do not. The presence of reactive groups in a polymer can be used to modify its properties in a variety of ways. For example, the presence of hydroxyl groups can be used to improve the adhesion of a polymer to a substrate. The presence of carboxylic acid groups can be used to improve the solubility of a polymer in water. The presence of amine groups can be used to improve the reactivity of a polymer with other materials.

There are many different ways to synthesize polymers containing functional groups. One common method is to use a monomer that contains the functional group of interest. Another method is to use a reaction that introduces the functional group into the polymer chain. The choice of method depends on the specific application and the properties of the polymer that are desired.

The properties of polymers containing functional groups can be modified in a variety of ways. For example, the presence of reactive groups can be used to improve the adhesion of a polymer to a substrate. The presence of non-reactive groups can be used to improve the solubility of a polymer in water. The presence of both reactive and non-reactive groups can be used to improve the mechanical strength of a polymer. The properties of these polymers can be tailored to meet the needs of a specific application.

In the field of composites, polymers containing functional groups are used as matrix materials. The functional groups in these polymers can be used to improve the adhesion of the polymer to the reinforcement fibers. This improves the mechanical strength of the composite. Polymers containing functional groups are also used in the field of coatings. The functional groups in these polymers can be used to improve the adhesion of the coating to the substrate. This improves the durability of the coating.

Polymers containing functional groups are a versatile class of materials. They can be used in a wide variety of applications, and their properties can be modified to meet the needs of a specific application. This makes them an important class of materials in many areas of science and technology.